AGRICULTURAL NEWS LETTER

VOL. 7 - NOS. 6 AND 7 JUNE-JULY, 1939

This publication gives information on new developments of interest to agriculture on laboratory and field investigations of the du Pont Company and its subsidiary companies.

In addition to reporting results of the investigations of the Company and its subsidiaries, published reports and direct contributions of investigators of agricultural experiment stations and other institutions are given dealing with the Company's products and other subjects of agricultural interest.

DU PONT
REG. U. S. PAT. OFF.

ISSUED BY PUBLIC RELATIONS DEPARTMENT, E. I. DU PONT DE NEMOURS & CO., INC., WILMINGTON, DEL.

AGRICULTURAL NEWS LETTER

Vol. 7 - Nos. 6 and 7 June - July, 1939

This issue contains:

#######

Agricultural News Letter (du Pont)
Vol. 7, Nos. 6 and 7, June-July, 1939

AGRICULTURE AT THE WORLD'S FAIR

Chemical contributions to agriculture, a scientific liaison of land and laboratory, are featured as a part of the du Pont Wonder World of Chemistry at the New York World's Fair. An average of 20,000 visitors from all parts of the country view the exhibit daily. Du Pont chemists have seized the opportunity to show what can happen when science puts on overalls and gets down to the farm problem.

The show emphasizes the importance of research in efficient farming procedure. It dwells, also, on the chemurgic theme, pointing out the mounting tonnage of farm products finding a place in industry. The "partnership" is depicted both in serious presentations and in a good-humored puppet show recounting the points of mutual dependence.

One of the outstanding demonstrations is a model pest control laboratory. Dr. Mortimer D. Leonard, formerly of the New York State and U. S. entomological services, is in charge. This part of the exhibit, incidently, has proved one of the most popular with laymen, among them thousands of New Yorkers to whom the bean beetle and codling moth are as strange as dragons. Dr. Leonard has set up a standard turntable for spraying plants. Sprayed and unsprayed specimens are then exposed in feeding chambers to several injurious leaf-eating species. A reduced model of a Peet-Grady lethal chamber is operated to show development and evaluation of household insecticides.

Flies, boll weevils, the Japanese and Mexican beetles, army worms and corn borers are among Dr. Leonard's transitory guests.

Another part of the exhibit is a demonstration of making ammonium carbamate, the crystals forming from a mixture of gases inside a glass cylinder. Lecturers comment on the display, telling of its application in crystal urea. They interpret the significance of this development in their commentary. They call attention to the practicability of fertilizer concentrates in eliminating freight charges on sand and other inert fillers.

Giant wall displays feature the agricultural products used today in making chemical products. These include vegetable oils, corn, and cotton. Another animated mural depicts these commodities on their way from field to factory, with a steady stream of fertilizers, insecticides, explosives for field clearing, wood treatments and vitamin-builders making the return trip in chemical reciprocity.

The marionette show devoted to agriculture tells its tale in sprightly, humorous verselets. Fertilizers, seed disinfectants and insecticides are cloaked in magic garb endowing them with human faculties. They dance, bow, rout bugs, laugh and chant in such a gay vein that visitors invariably applaud

Continued on next page

this part of the show. The little verses are particularly appreciated by both farming and urban patrons. A sample, recited by Fertilizer:

> There once was an under-fed plant,
> Which leaned at a dangerous slant
> But when I arrived
> It quickly revived
> Now it wants to lie down and it can't.

Notwithstanding this lighter tone, the exhibit recognizes the importance of the agricultural problem both scientifically and economically. It tells what has been done so far, what is in prospect and what may be reasonably expected in the husbandry of tomorrow. Soil chemistry, the eventual conquest of all plant disease, weeds and harmful insects, plant genetics and similar advances are cited among the opportunities being fostered.

Du Pont is translating this madrigal of science with the soil in terms that the average man can understand. The objective is to show that the economy of the future lies in the laboratory, and that chemistry's enrichment of the harvest is a major salient of the battle.

Agricultural News Letter (du Pont)
Vol. 7, Nos. 6 and 7, June-July, 1939

APPROVED COTTON CULTURE METHODS DISCUSSED IN BULLETIN OF GEORGIA EXTENSION SERVICE

EDITOR'S NOTE:- The excerpts are from a bulletin on cotton culture and should be an invaluable aid to planters and others concerned with the growing of this crop.

"Cotton Culture in Georgia" is the title of a new bulletin (No. 469) by E. C. Westbrook, Extension Cotton Specialist, recently issued by the Georgia Agricultural Extension Service, Athens, Ga.

The bulletin covers a great many important factors in the successful production and marketing of this important Southern farm crop. It begins with a discussion of the economic importance of the crop and ends with a brief statement on new uses for cotton. In between, the author takes up such cultural practices as varieties, seed bed preparation, fertilization, seed for planting, planting, spacing, cultivation, insect enemies, diseases, picking, ginning, storing, and marketing.

The bulletin points out that cotton is the basic crop in the agricultural life of Georgia. It says:

> "As Georgia is predominantly an agricultural state, the economic welfare of every citizen, despite personal activities, rests in a large measure upon an agricultural foundation of which cotton is the keystone."

Varieties--The bulletin lists a number of new varieties which are early, fruit rapidly, have a staple length of 1 inch to 1-1/16 inch, and have the ability to make large acre yields. For the southern half or the Coastal Plain section of the state, only wilt-resistant varieties are recommended.

Seed Bed Preparation--Pointing out that thorough breaking is one of the first essentials in preparing land for cotton, the bulletin adds:

> "On most soils in the state, better stands are obtained when a medium high seed bed is thrown up. Where possible, the seed bed should be thrown up at least two weeks before planting. A rain on the seed bed before planting is very helpful in securing a good stand."

Thirty-six Pounds of Nitrogen Per Acre

The bulletin states that the best all-around fertilizer for cotton on average Georgia soil is one that supplies 30 to 36 pounds of nitrogen, 32 to 48 pounds

Continued on next page

of phosphoric acid, and 24 to 36 pounds of potash per acre. It adds that there are very few soils in Georgia that do not need 36 pounds of nitrogen per acre, and that if this amount of nitrogen is applied early in the season, either at planting or at chopping time, it will hasten the maturity of cotton. In discussing time of application of nitrogen, the bulletin says:

> "On heavy soils that are not subject to leaching, about the same yields have been obtained where all the nitrogen was applied at the time of, or before planting, as compared with applying a part of the nitrogen at planting and the remainder as a side dressing at chopping time.
>
> "However, on sandy soils that are subject to leaching, better results have been obtained by applying a part of the nitrogen at or before planting time, and the remainder as a side dressing at chopping time."

"Ceresan" Seed Disinfectant Recommended

The bulletin states that experiments have shown that poor cotton stands can be reduced by treating the seed with ethyl mercury chloride dust. The bulletin adds that better stands result because the treatment checks seed and root rot, reduces "damping off", and gives the young plants a chance to develop a stronger root system which helps them grow faster. It states further:

> "The recommended material for treating cotton seed is a two per cent organic mercury compound sold under the trade-name of 'Ceresan.' Three ounces of two per cent 'Ceresan' will treat one bushel of seed; a pound will treat five bushels."

The bulletin points out in the footnote that:

> "At the present time, 'Ceresan' is the only product of its kind that has been tested by experiment stations sufficiently to justify a recommendation. Plans are underway for testing other seed treatment materials. The results of such tests can be obtained when they are ready for release by writing to the experiment stations."

The fact is stressed that in the tests that have been made, seed treated with "Ceresan" have given a larger number of plants per acre than untreated seed. Plants from treated seed tend to be free from seed and soil-borne disease organisms. Benefits from seed treatments, it adds, are greatest when the spring season is cold and wet.

The bulletin has a drawing of a machine utilizing a barrel or oil drum which can be made on the farm and used as a means of making a very effective seed treatment.

Continued on next page

Control of the Boll Weevil

"The boll weevil," the bulletin states, "is the worst insect enemy of cotton. Damage done the crop each year by the boll weevil runs into millions of dollars.

"Where boll weevils are numerous in the fields before squares begin to form, these early, over-wintered weevils can be killed by making from one to three pre-square applications of calcium arsenate.

"The pre-square poisoning may be done by using calcium arsenate dust or by mopping the cotton with a mixture of calcium arsenate, syrup, and water.

"If the sweetened poison is used, mix thoroughly one pound of calcium arsenate, one gallon of syrup, and one gallon of water. This mixture should be applied directly to the young plants when the cotton is dry. A home-made burlap mop makes a good applicator."

Other Cultural Practices--It is suggested that persons interested in these and other cultural practices discussed in the bulletin (such as planting practices, including time to plant, amount of seed to plant, depth of planting, seasonal differences; spacing; cultivation; control of insects and diseases; picking, ginning, storing, and marketing) write to the Agricultural Extension Service at Athens, Ga., for a copy of the bulletin. It includes numerous pertinent recommendations on these subjects, too numerous and detailed to be included here.

"Ceresan" is a trade-mark registered in the United States Patent Office, Washington, D. C., by the Bayer-Semesan Company, Wilmington, Delaware.

#######

Agricultural News Letter (du Pont)
Vol. 7, Nos. 6 and 7, June-July, 1939

MOISTURE PEELING OF HOUSE PAINTS IS CAUSED LARGELY BY MODERN CONSTRUCTION PRACTICES A SURVEY INDICATES

EDITOR'S NOTE:- Agricultural engineers, architects, builders and others concerned with the design and construction of buildings can profit from the results of the survey which is summarized here.

In the April Meeting of the American Chemical Society in Baltimore, Messrs. J. W. Iliff and R. B. Davis, du Pont Company chemists, presented a paper on the "Moisture Peeling of House Paints," which outlined a survey that has been made of more than 450 frame houses throughout the United States, together with an experimental program on a small specially constructed house in Philadelphia, in which certain details of side wall construction could be varied. A number of important conclusions were reached which relate moisture peeling of house paint to such construction details, and suggestions were made as to certain points which it is felt should be considered by architects and builders in designing buildings.

The conclusions were as follows:

1. The survey of houses indicated that over one half of the frame houses in the Northeastern part of the United States show some degree of moisture failure, varying from areas as little as three square inches in some buildings to areas of several square feet in others. The presence or the absence of moisture failure appeared to be independent of the type of paint used on the building. Moisture failure almost always started with a loss of adhesion during the winter months, although in many cases actual peeling was delayed until the film hardened in the summer. The proportion of houses showing moisture failure seemed to be higher among those constructed during the past few years than for the houses of older construction. In the warmer and drier sections of the country the presence of moisture failure was much less than in the Northeastern part of the United States.

2. Studies based on the small test house showed that tar paper placed between the sheathing and the siding retards but does not stop paint failure resulting from condensation of moisture on the interior walls of the building.

3. The introduction of a tight seal between the interior and exterior wall surfaces will reduce, and, in some cases, prevent moisture failure of paint due to condensation.

4. The blocking of free air circulation in side walls will permit greater moisture failure. Consequently, if air circulation in the walls is to be blocked, the introduction of a tight seal between interior and exterior wall surfaces becomes highly important.

Continued on next page

5. The introduction of external ventilation immediately behind the siding prevents failure of paints applied to these exterior wall surfaces.

6. Moisture which is responsible for paint failure may reach the wood in one of two ways. The first is that ordinarily associated with careless construction, namely, liquid water getting in back of siding due to leaks in the external surface of the building. The second is water in vapor form migrating from the warm interior of the house and condensing against the cold exterior portion of the wall or the clapboards. The first source is well recognized in the industry. The second is becoming more important, however, due to changes which have taken place in house construction in recent years in the effort to promote lower heating cost and more comfortable living conditions, by the tightening of construction against outside weather, and by humidifying the air inside of houses.

Agricultural News Letter (du Pont)
Vol. 7, Nos. 6 and 7, June-July, 1939

TWO METHODS OF PRESERVING PLANT AND INSECT SPECIMENS IN NATURAL COLORS DEVELOPED BY GOVERNMENT SCIENTISTS

EDITOR'S NOTE:- The methacrylate resins and cellulose acetate film are finding various uses for scientific purposes. "Lucite" methyl methacrylate resin, a du Pont product, is used in surgical instruments and laboratory equipment, and otherwise in fields of science.

Two methods of preserving indefinitely in their natural colors such agricultural specimens as leaves, flowers, fruits, seeds, insects, and other biological material have been developed by chemists of the United States Department of Agriculture. The processes, while supplementing each other, have different fields of application--one for dried and the other for fresh material.

In the method studied by Dr. Charles E. Sando, specimens are suspended and embedded in methacrylate, a crystal-clear plastic similar to materials used in making nonshatterable airplane windows. In this process, the specimens must be dehydrated or dried out to prevent moisture from clouding the glass-like plastic material. They may be air-dried or dehydrated by use of alcohol or ether.

Corn and other grains or seeds, insects, or anything that does not lose its color or shape with drying, may be preserved by this method, possibly only under controlled laboratory conditions. Once the plastic sets it can be machined and polished to a high lustre so that the specimen may be viewed from any angle. The largest mount prepared so far is an ear of hybrid corn.

Another Method of Preserving

The other method, developed by G. R. Fessenden, is a chemical process for treating fresh plant material in such a way as to toughen the tissues and set the natural color. The natural beauty of flowers, or the exact appearance of either healthy or diseased leaves, can be preserved by immersion in specially formulated water-removing syrups. Each plant species requires an individual treatment which has to be worked out from seven general types of formulas.

The old method of preserving botanical specimens--pressing and drying--was unsatisfactory because of loss of color and the fact they were easily destroyed by handling or by insects or mold. Specimens preserved by this new method are sealed between sheets of cellulose film so as to be protected from damage.

Due to the expected permanence of specimens preserved by either method, excellent records of both healthy and abnormal plants and insects may be made available for scientific research, study, and exhibition.

Although numerous specimens, prepared by both methods, have attracted considerable attention and created much favorable comment, there are a number of difficulties to be overcome before the final methods can be released for general use.

Agricultural News Letter (du Pont)
Vol. 7, Nos. 6 and 7, June-July, 1939

CELLULOSE SPONGE OFFERS DISTINCT ADVANTAGES FOR USE IN RESEARCH LABORATORIES AND DAIRIES

EDITOR'S NOTE:- One of the interesting products to come out of du Pont laboratories is the du Pont cellulose sponge. Its properties and some special uses are described here. Samples are available on request.

The need for sponges which can be thoroughly sterilized is supplied by the development of a cellulose sponge made from cotton linters and wood pulp, processed to give the finished product its sponge-like appearance and properties.

Not only is this sponge free of grit, pieces of shell and other foreign matter, but it can be cleaned by rinsing in cold or hot water and squeezing, and it can be sterilized completely by boiling in water. It also can be sterilized in an autoclave.

Although the cellulose sponge is now widely used for every purpose for which sponges from the sea may be used, the chemical product is especially valuable for use in laboratories and dairies, and otherwise where absolute cleanliness is essential.

The sponge serves various purposes in research and other laboratories, and for veterinary uses.

A special use is as a compression pad in x-ray work. It has been found very valuable because of its rigidity, when dry, which prevents the sponge becoming compressed when pressure is applied. It is not opaque to x-rays, does not cast a shadow, and, therefore, does not interfere with the quality of the negative.

Uses of the sponge on dairy farms include the washing of the udders of cows, grooming animals, and cleaning utensils. For these purposes, the sponge has proved much more satisfactory and lasts longer than a cloth.

Dairies use the sponge for general cleaning purposes and for washing and polishing stainless-steel equipment such as pasteurizers, coolers, storage tanks and sanitary piping.

Among advantages offered by the sponge is its absorbent capacity -- it holds twenty times its weight in water; it floats and, therefore, does not pick up grit from the bottom of a pail or other vessel; it is free from lint, so may be used for drying and polishing. The sponge is available in different textures, and in uniform shapes and sizes.